Headache

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A detailed systematic history is the key to diagnosing and effectively managing patients with this common and disabling condition

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Summary box

Headache disorders are common in general populations everywhere

They are potentially disabling, and impose heavy individual and societal burdens; appropriate effective management should have higher priority than it does at present

Most patients with headache have one of three medically non-serious conditions and are best managed in primary care

Recognition of serious causes of headache requires a standardised diagnostic approach to history and examination coupled with an awareness of a relatively small number of important secondary headache disorders

Headache affects most people, at least occasionally. It is high among the reasons why people consult general practitioners and neurologists.[1 2] It may signal serious underlying illness, but, more importantly, it is associated with personal and social burdens of pain, disability, damaged quality of life, and financial cost.[3 4] It ought to be a huge public health issue, but headache receives little priority in the queue for healthcare resources.[5]

The diagnosis and management of most headaches require neither advanced neurological skills nor investigations.

Sources and selection criteria

We reviewed published and other accessible information sources, including the World Health Organization's world health report,[6] major epidemiological surveys, the classification and diagnostic criteria of the International Headache Society,[7] reports of clinical trials, and selected national management guidelines. We used the definitive textbook on headache disorders—*The headaches*—as a reference source.[8] Treatment recommendations in the present paper were based on evidence but, other than for the newer drugs, this was often limited to expert opinion and practice.

Diagnosing headache

Sufficient time committed to a systematic headache history is the key to effective diagnosis (see box 1). The correct diagnosis is not always evident initially, especially when the patient has more than one type of headache. A diary kept for a few weeks can establish the pattern of attacks, symptoms, and medication use. A change in pattern signals something new—aggravating circumstances, or the onset of a new headache disorder. New headache, in young and old patients, needs especially careful inquiry.

If the history is adequate, physical examination rarely reveals unexpected signs—rather, it reassures patient and physician. Measurement of blood pressure and a brief but comprehensive neurological examination, including that of the optic fundi, are recommended. Examination of the head and neck may reveal muscle tenderness, limited range of movement, or crepitation (which suggest a need for physical forms of treatment but not necessarily the cause of the headache). Investigations, including neuroimaging,[9] rarely contribute to the diagnosis of headache when the history and examination suggest no underlying cause.

Important headaches

The International Headache Society classified 13 types and many more subtypes of headache disorder.[7] The box on bmj.com gives a simplification of this classification. However, three primary headaches—migraine, tension-type headache, and cluster headache—together with one secondary headache disorder (medication overuse headache) account for the type of headache of most consulting patients.

Migraine

Migraine is a common disorder affecting 2-15% of the world's populations, causing more disability than does epilepsy.[6] It is more prevalent in the productive years (late teens to 50s) and in women than in men (3:1). Every day, a million people in European Union countries have a migraine attack (TJ Steiner, unpublished), and an estimated 100 million workdays or schooldays are lost annually because of migraine.

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A box showing classification of headache disorders can be found on bmj.com

Box 1: An approach to the headache history*

1. *How many different types of headache does the patient experience?*
Separate histories are necessary for each type of headache. It is reasonable to concentrate on the one that is most bothersome to the patient but other headaches should always be reviewed in case they are clinically important.

2. *Time questions*
a) Why consulting now?
b) How recent in onset?
c) How frequent, and what temporal pattern (especially distinguishing between episodic and daily or unremitting)?
d) How long lasting?

3. *Character questions*
a) Intensity of pain
b) Nature and quality of pain
c) Site and spread of pain
d) Associated symptoms

4. *Cause questions*
a) Predisposing and/or trigger factors
b) Aggravating and/or relieving factors
c) Family history of similar headache

5. *Response questions*
a) What does the patient do during the headache?
b) How much is activity (function) limited or prevented?
c) What medication has been used and is being used, and in what manner?

6. *State of health between attacks*
a) Completely well, or residual or persisting symptoms?
b) Concerns, anxieties, fears about recurrent attacks and/or their cause

*This box is taken from the British Association for the Study of Headache management guidelines[21]

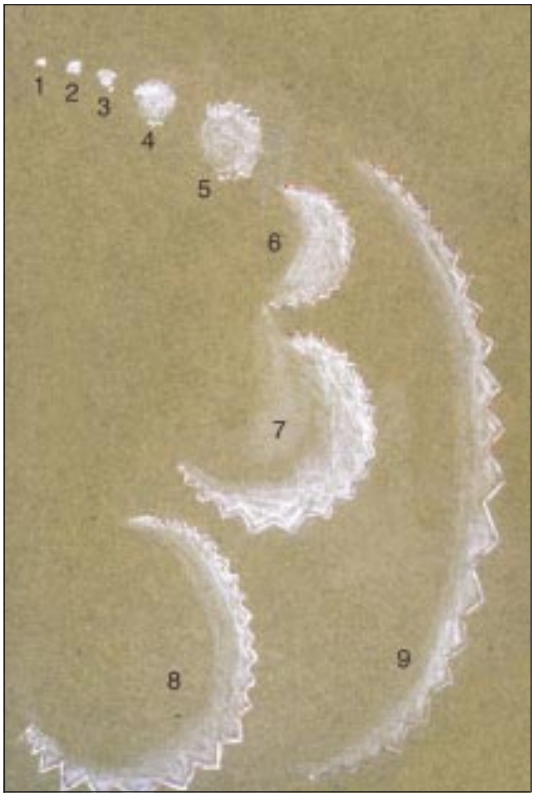
Migraine is a primary headache disorder: evidence is growing of a genetic basis.[10] It is no longer seen as a primary vascular disorder. Activation of the trigeminovascular system by a mechanism that may originate in the brainstem causes the release of algesic inflammatory substances, vasodilatation, and plasma extravasation. Why this happens periodically, and what brings the process to an end in spontaneous resolution of attacks, are unknown.

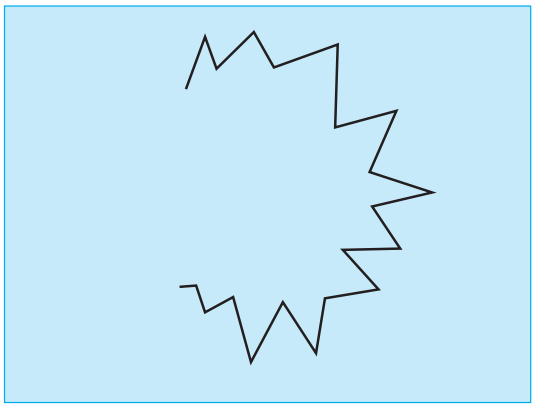
Adults with migraine describe episodic attacks with specific features (box 2), of which nausea has the greatest diagnostic value.[11]

A third of people with migraine sometimes or always have aura before headache—hemianopic disturbance or a spreading scintillating scotoma (figure) or, less commonly, other reversible focal neurological disturbances such as unilateral paraesthesiae of hand, arm, or face lasting 10-60 minutes. Long duration aura is rare and warrants investigation. Visual auras can occur without headache, especially in older patients (over 40).

Box 2: Typical (but not essential) features of migraine headache

- Moderate or severe pain, which may be unilateral or throbbing
- Lasts hours to 2-3 days
- Aggravated by routine activity
- Associated with nausea and sometimes vomiting
- Accompanied by photophobia and phonophobia
- Attacks occur between once a week and once a year (median one per month)





Typical visual aura spreads across the visual field (1-9) over about 30 minutes (above). Patients can draw their visual aura. Representation of a scintillating scotoma is pathognomonic of migraine (below)

Tension-type headache

Episodic tension-type headache—"normal" or "ordinary" headache—is less disabling but more prevalent (up to 80%) than migraine.[12] It also occurs in attack-like episodes, mostly lasting a few hours, with variable frequency. Headache is often described as pressure or tightness, like a band around the head, sometimes spreading into or from the neck. It lacks the specific features and associated symptom complex of migraine.

Chronic tension-type headache occurs, by definition, on >15 days a month and can be daily and unremitting.[7] It affects 2-3% of adults, who may be substantially disabled and chronically off work as a result.[13]

Tension-type headache may be stress related or associated with functional or structural cervical or cra-

nial musculoskeletal abnormality. These aetiological factors are not mutually exclusive.

Cluster headache

Cluster headache is an extremely unpleasant condition that affects 1 in 1000 men and 1 in 6000 women; most are in their 20s or older and many are smokers. It is one of a group of conditions (trigeminal autonomic cephalalgias) of uncertain pathophysiology characterised by frequently recurrent, short lasting headache and autonomic symptoms.

Cluster headache is highly recognisable. The episodic form occurs in bouts (clusters), typically of 6-12 weeks' duration once a year or every two years and at the same time of year. Strictly unilateral intense pain around the eye develops once or more daily, commonly at night. The patient, unable to stay in bed, agitatedly paces the room, even going outdoors, sometimes beating his or her head on the wall or floor until the pain diminishes after 30-60 minutes. The eye is red and waters, the nose runs or is blocked on that side, and ptosis may occur. Atypical presentations are more common in women. In the chronic form, which is less common, no remissions occur between clusters, and a continuous milder background headache may additionally develop. The episodic form can become chronic, and the chronic form episodic, but once present, cluster headache can persist for 30 years or more.

Medication overuse headache

Daily or near-daily headache is at epidemic levels, affecting up to 5% of some populations,[14] and chronic overuse of headache drugs may account for half of this phenomenon.[15] All simple analgesics, and probably non-steroidal anti-inflammatory drugs, ergotamine, and triptans,[16] are implicated.[17] Medication overuse headache affects more women than men (5:1) and some children.

What constitutes medication overuse in individual cases is not clear. The regular intake of three or more analgesic tablets daily or narcotics or ergotamine on more than two days a week are suggested arbitrary limits.[18] Low doses daily carry greater risk than larger doses weekly. A common and probably key factor in medication overuse headache is pre-emptive use of drugs, in anticipation of—rather than for—headache. Medication overuse headache does not develop when analgesics are regularly taken for another indication, such as chronic backache or rheumatic disease.[19] Headache must be there to begin with.

A presumptive diagnosis of medication overuse headache is based on symptoms and a detailed history of drug use, including over the counter drugs. A prospective diary record over two weeks may help the drug history. Many patients with medication overuse headache use large quantities of drug: 35 doses a week on average in one study, and six different agents.[20] Sooner or later, they seek prescriptions for "something stronger," bringing them to the general practitioner's attention. However, medication overuse headache is confirmed only when symptoms improve after drugs are withdrawn. The headache is oppressive, present, and often at its worst on awakening in the morning. It is increased after physical exertion. Associated nausea and vomiting are rarely pronounced. A typical history begins with episodic headache up to years earlier (more commonly migraine than tension-type headache), treated with an analgesic or other acute medication. Over time, headache episodes become more frequent, as does drug intake, until both are daily. In the end stage, which not all patients reach, headache persists all day, fluctuating with medication use repeated every few hours. This evolution occurs over a few weeks or much longer,[20] depending largely—but not solely—on the medication taken.

Box 3: Causes of headache that must not be missed

- Intracranial tumours: produce headache when they are large enough to cause raised intracranial pressure, which is usually apparent from the history. Papilloedema or focal neurological signs, or both, will usually be present
- Meningitis: usually accompanied by fever and neck stiffness in an obviously ill patient
- Subarachnoid haemorrhage: headache is often described as the worst ever, and is usually (but not always) of sudden or ictal onset. Neck stiffness may take hours to develop. In elderly patients particularly, classic symptoms and signs may be absent
- Temporal arteritis: headache is persistent but often worse at night and sometimes severe, in a patient over 50 who does not feel entirely well. It may be accompanied by marked scalp tenderness
- Primary angle closure glaucoma: rare before middle age, may present dramatically with acute ocular hypertension, a painful red eye with the pupil mid-dilated and fixed and, essentially, impaired vision, and nausea and vomiting. In other cases, headache or eye pain is episodic and mild. The diagnosis is suggested if patient reports coloured haloes around lights
- Idiopathic intracranial hypertension: rare cause of headache; occurs especially with obese young women. May not be evident on history alone; papilloedema indicates the diagnosis
- Subacute carbon monoxide poisoning: uncommon but potentially fatal. Symptoms include headaches, nausea, vomiting, giddiness, muscular weakness, dimness of vision, and double vision

Headaches that cause concern

Some causes of headache must not be missed (box 3). In these cases, the patient's history awakens dormant suspicion, and physical examination provides support for a diagnosis that requires immediate action.

Overdiagnosed headaches

Headache should not be attributed to sinus disease in the absence of other symptoms.[7] Errors of refraction are overestimated as a cause of headache.

Managing headache

Good headache management is not always easy but it is often rewarding, and it requires the clinician to have an understanding partnership with the patient. Most headache is best managed in primary care; specialist referral is appropriate when the diagnosis remains (or becomes) unclear or the measures below fail.

Migraine

Migraine is sometimes adequately self managed with over the counter remedies. Some specialists emphasise disability assessment to establish priority for medical treatment. There are few patients, however, whose lives cannot be improved by an agreed and supervised management plan, the right medical intervention in which drugs play only a part (box 4), and the objective of minimising detriment to life and lifestyle. Although cure is not a realistic aim, management failure is often due simply to sights being set too low.

A proposal for the rational use of triptans*

Use	Dose regimen
Appropriate for first use of a triptan	Sumatriptan 50 mg, zolmitriptan 2.5 mg, or almotriptan 12.5 mg orally
When greater efficacy is needed	Rizatriptan 10 mg, sumatriptan 100 mg, or zolmitriptan 5 mg orally, or sumatriptan 20 mg nasal spray (which some patients prefer)
In reserve (pending routine clinical experience)	Eletriptan 40 mg or (if needed for efficacy) 80 mg orally
When a rapid response is important above all	Sumatriptan 6 mg subcutaneously
When vomiting precludes oral therapy	Sumatriptan 6 mg subcutaneously
When side effects are troublesome with other triptans	Naratriptan 2.5 mg or almotriptan 12.5 mg orally
When relapse is a particular problem	Ergotamine tartrate 1-2 mg rectally may be useful

*It is assumed that each patient will try them in order until satisfied with the outcome.

Predisposing and trigger factors

A few predisposing factors (stress, depression, anxiety, menstruation, menopause, head or neck trauma) are well recognised; they are not always avoidable but sometimes treatable. Many migraine attacks have no obvious triggers. Diaries are useful in trigger detection. An enforced change in lifestyle to avoid triggers can itself adversely affect quality of life.

Acute drug therapy

Published trials and clinical practice show that drugs are effective, but no single drug works consistently in everyone. Without established predictors of efficacy, patients should work through the options in a rational order to find what is best for them. "Stepped care" is one way of achieving this.[21] The goal—resolution of symptoms within two hours—is not attainable in all cases.

Simple oral analgesia—aspirin 900 mg, paracetamol 1000 mg, or ibuprofen 400 mg taken in soluble form and early before gastric stasis develops—works for many patients. A prokinetic anti-emetic (metoclopramide 10 mg or domperidone 20 mg) enhances the analgesic effect by promoting gastric emptying and is most suitable for managing nausea and vomiting. When these teatments fail, expert opinion suggests diclofenac 100 mg and domperidone 30 mg taken rectally.[21]

Triptans should not be withheld from patients who need them. One triptan may work but not another, so patients may reasonably try each in turn. Because efficacy is generally coupled with side effects, a logical order is proposed (table).

Prophylaxis

When symptom control with best acute treatment is inadequate (the judge of this being the patient), a prophylactic agent (box 5) is added, usually for four to six months, to reduce the number of attacks.[22] Because no one treatment is reliably effective, comorbidities and contraindications guide choice. Poor compliance is a major factor impairing effectiveness, so dosing once a day is preferable.[23] In some women, hormonal influences are important determinants of the frequency of attacks, and a special approach may be taken to menstrually related migraine.[24]

Box 4: Six elements of good management of migraine in primary care

- Correct and timely diagnosis
- Explanation and appropriate reassurance
- High but realistic objectives, agreed by doctor and patient
- Identification of predisposing or trigger factors and how to avoid them
- Intervention (drug or non-drug, or both)
- Referral when these measures fail

Box 5: Prophylactic drugs with some efficacy in migraine

- β Blockers without partial agonism (atenolol 50-200 mg (unlicensed indication) or propranolol (long acting) 80-320 mg daily)
- Sodium valproate 0.6-2.5 g daily (unlicensed indication)
- Pizotifen 1.5 mg daily
- Amitriptyline 50-150 mg at night (unlicensed indication)
- Methysergide 1-2 mg three times a day (hospital supervision recommended; restrict use to less than six months)

Menstrually related migraine

- Mefenamic acid 500 mg three to four times a day from first to last days of menstruation
- Transdermal oestrogen 100 µg patches (50 µg if not well tolerated) twice weekly or estradiol 1.5 mg in 2.5 g gel daily from three days before menstruation for seven days (unlicensed indication)
- Combined oral contraceptives taken continuously, or for nine weeks rather than three weeks (unlicensed indication); avoid in migraine with aura

Tension-type headache

Most people with tension-type headache manage themselves. Episodic tension-type headache is self limiting and rarely raises anxiety levels, but people consult doctors when it is becoming frequent and may no longer be responding to painkillers.

Predisposing factors

Tension-type headache is more common in sedentary people, and regular exercise may help. Stress may be obvious and likely to be aetiologically implicated. Musculoskeletal involvement may be evident in the history or on examination. Sometimes, neither of these factors is apparent. In the background of chronic tension-type headache, clinical depression will defeat management if not diagnosed and treated appropriately.

Intervention

Reassurance and over the counter analgesics (aspirin 600-900 mg, paracetamol 1000 mg, ibuprofen 400 mg) are sufficient for infrequent episodic tension-type headache (fewer than two days per week) without risk of escalating consumption.

Long term remission is the objective of management in frequent episodic or chronic tension-type headache. Physiotherapy is the treatment of choice for musculoskeletal symptoms. In stress related illness, lifestyle changes to reduce stress, and relaxation or cognitive therapy to develop strategies for coping with stress, are the treatment mainstays. Amitriptyline (10 mg at night, increasing in increments to 50-150 mg as side effects permit) is the drug treatment of choice; it should be withdrawn after improvement has been maintained for four to six months. Sodium valproate (400-1500 mg/day) is also sometimes effective, and its use is increasing. Remission is not always achievable: a pain management clinic may be the final option in long standing chronic tension-type headache.

Cluster headache

Because cluster headache is uncommon in primary care, it may go misdiagnosed for years. This is tragic because

Box 6: Specialist treatments for cluster headache

Acute treatments

- Sumatriptan 6 mg subcutaneously
- Oxygen 100% at 7 l/min (requires special mask and regulator) helps some people
- Analgesics have no place in treating cluster headache

Prophylaxis

- Verapamil (240-960 mg/day)
- Prednisolone (60-80 mg/day for two to four days, discontinued by dose reduction over two to three weeks)
- Lithium carbonate (600-1600 mg/day), with higher doses and serum concentrations (0.8-1.4 mmol/l) over short periods in episodic cluster headache
- Ergotamine (2-4 mg/day per rectum, usually omitted every seventh day)
- Methysergide (1-2 mg three times daily)

Apart from prednisolone, treatment should be discontinued two weeks after full remission. Failure of one drug does not predict failure of others. Combinations may be tried, but the potential for toxicity is obviously high.

although it is horribly painful, it is treatable. The general practitioner has an important role in discouraging inappropriate "treatments" (tooth extraction is not uncommon). Otherwise, urgent referral for specialist management (box 6) is recommended at each onset.

Alcohol potently triggers cluster headache. Most patients avoid it during clusters.

Medication overuse headache

Prevention is ideal, with education being the key factor: in a US study, 95% of patients with medication overuse headache were unaware that it was a medical condition.[25]

Early intervention is important because the long term prognosis depends on the duration of medication overuse.[26] Treatment is by withdrawal of the suspected drug(s). Although this will lead initially to worsening headache and sometimes nausea, vomiting, and sleep disturbances, with forewarning and explanation withdrawal is probably most successfully done abruptly.[27] Within two weeks, usually, the headache shows signs of improvement, which continues for weeks to months; 50-75% of patients revert to their original headache type. Most patients require extended support: the relapse rate is around 40% within five years.[26]

Headaches that cause concern

All of the headaches shown in box 3, except carbon monoxide poisoning, require immediate specialist referral. When carbon monoxide poisoning is suspected, the primary care team is best placed to arrange inspection of domestic gas appliances (gas flames should burn blue, not yellow or orange).

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Additional educational resources

- International Headache Society (www.i-h-s.org): includes all published guidelines and recommendations of the IHS, and professional educational pages are planned
- American Academy of Neurology (www.aan.com): includes a "migraine headache module" with materials for physicians to identify potential areas for change, develop and implement a plan for change, and measure the changes made (with AMA CME credits)
- PRODIGY (Practical Support for Clinical Governance) (www.prodigy.nhs.uk): includes guidance on headache management (shortly to be updated) for primary care in the United Kingdom

Information for patients

- World Headache Alliance (www.w-h-a.org): a constantly updated source of detailed and quality controlled information on headache for the general public, with many useful links
- American Medical Association (www.ama-assn.org/special/migraine/migraine.htm): a "migraine information center" that includes information on other headache disorders for physicians and the general public
- Organisation for the Understanding of Cluster Headaches (OUCH UK) (www.clusterheadaches.org.uk): a source of information and self help support for sufferers and carers; the organisation can loan high-flow oxygen regulators

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Commentary: Headache in South America

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Headache is an important cause of disability worldwide. Epidemiological studies in developed countries have shown a 40% prevalence of sporadic headache and a 15% prevalence of chronic primary headaches—migraine, and tension-type headache—in the general population. Because most patients are young or middle-aged adults in their productive years, headache has a tremendous economic impact that has been estimated to be several billion dollars per year.[1] In Latin America, the magnitude of the disease has been difficult to assess because good studies are scarce. The problem is compounded in areas where large segments of the population do not have access to doctors and where facilities for diagnosis are not available. Nevertheless, recent studies from Brazil, Chile, and Ecuador show that headache is highly prevalent in these countries and imposes a large economic burden on healthcare systems, which are already stretched to the limits.[2 3]

As in developed countries, migraine and chronic tension-type headache are the most common subtypes of headache disorders in South America.[2 3] This may be explained partially by the low socioeconomic status of large segments of the population, as well as by genetic susceptibility, dietary habits, or environmental conditions. Environmental conditions may be an important risk factor for headache, particularly for people living at high altitudes in the Andean region.[4] Other studies have shown that some parasitic diseases of the nervous system, such as neurocysticercosis (figure) or Chagas' disease, may also account for the high prevalence of chronic headache in these areas.[5 6] Medication overuse headache has not been investigated in South America, but it may be high in countries where most people self medicate for common diseases and potent analgesics can be obtained at the pharmacy without prescription.

The scenario of chronic headaches is more or less the same in developing as in developed countries, but the prevalence, causes, and prognosis of acute headache are quite different. In South America, infectious processes such as dengue, salmonellosis, or epidemic viral encephalitis (Venezuelan equine encephalitis) account for a large percentage of cases of acute headache in patients presenting to emergency rooms.[7] Such conditions must be properly diagnosed and treated to avoid further morbidity and mortality. Again, the actual prevalence of these acute secondary headaches is largely unknown, and large scale epidemiological studies are needed to assess the problem.

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Environmental conditions may be a risk factor for headache in the Andean region

Regarding therapy, newer antimigraine drugs (triptans) are beyond the economic reach of most people in South America. Most migraine sufferers are treated with common analgesics, which are not effective in all cases. In such deprived areas, whether due to poor patient compliance or to the high costs of some drugs, the prophylactic treatment of migraine is also highly unsatisfactory. Sporadic or chronic tension-type headaches are usually managed in South America with common analgesics, muscle relaxants, or antidepressants—an approach that does not differ from that practised in developed countries.

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